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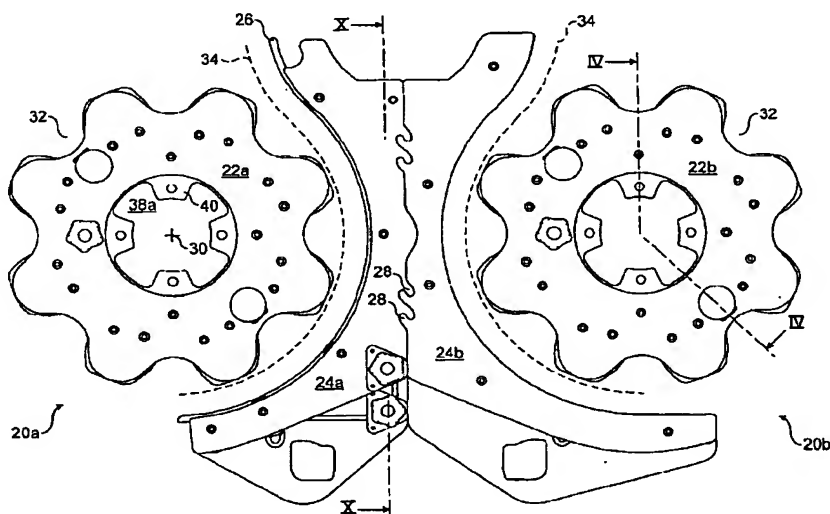
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Published:

— with international search report

[Continued on next page]

(54) Title: **ADJUSTABLE STAR WHEEL CONVEYOR**



(57) Abstract: The present invention relates to an adjustable star wheel and guide rail assembly for use with containers being processed on an automated handling line between machines such as rotary packaging machines. Star wheels derive their name from their general shape. The star wheels of this invention have fingers that support containers, such that they convey the containers as the star wheel rotates. Conveniently, the fingers of the present invention may be set in any position within their range of movement. In addition, a supporting guide rail may be adjusted, for example by rotation on cams. Thus, the fingers and the guide rail may be set to convey containers of varying sizes whilst keeping the container's centres travelling along the centreline of the conveyor.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(88) Date of publication of the international search report:

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB2004/004142

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65G47/84 B65G29/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B65G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 366 225 A (SHIBUYA KOGYO CO LTD) 2 May 1990 (1990-05-02)	1-4,6
Y	column 5, line 51 - column 14, line 53 figures 1-12	5,7, 25-28, 32-35, 58,59, 78,79, 82,83
Y	EP 0 659 683 A (IMA SPA) 28 June 1995 (1995-06-28) column 5, line 40 - column 10, line 34 figures 1-22	5,7, 25-28
X	US 5 590 753 A (BERTSCHI PETER ET AL) 7 January 1997 (1997-01-07)	1,31
Y	column 2, line 20 - column 5, line 33 -/-	32-35

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

25 May 2005

Date of mailing of the international search report

13.06.2005

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB2004/004142

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 291 988 A (LEONARD ET AL) 8 March 1994 (1994-03-08)	52, 53, 56
Y	column 2, line 12 - line 64 figures 1-6 -----	57, 58
Y	EP 0 355 971 A (SHIBUYA KOGYO CO., LTD) 28 February 1990 (1990-02-28) column 3, line 39 - column 10, line 7 figures 1-4 -----	57, 59, 78, 79, 82, 83

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2004/004142

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 84, 85, 86
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-51

Adjustable star wheel

2. claim: Automated handling line guide rail assembly and conveyor

52-83

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 84,85,86

The claims 84,85,86 are rely on reference to the drawings contrary to Rule 6.2 (a) PCT.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB2004/004142

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0366225	A	02-05-1990	JP 2117515 A	02-05-1990
			JP 2615929 B2	04-06-1997
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US 5590753	A	07-01-1997	AT 157623 T	15-09-1997
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			EP 0355971 A2	28-02-1990
			KR 9209297 B1	15-10-1992
			US 5046599 A	10-09-1991



INVESTOR IN PEOPLE

Application No: GB0322492.0

Examiner: Dave Woolf

Claims searched: 1-21, 28-34

Date of search: 12 October 2004

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X,Y	X: 1-5, 19 Y: 8, 16-18, 20	US 4428474 A (GAU) Whole document, especially Figures 1 and 2.
X,Y	X: 1-5, 19 Y: 8, 16-18, 20	US 4512456 A (PEYTON) Whole document, especially Figures 1 and 3.
Y	8, 16-18, 20	DE 19903319 A (TINCATI) Figures 1-7

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^W:

B8A

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

B65G

The following online and other databases have been used in the preparation of this search report

Epodoc, WPI, PAJ



Application No: GB0413853.3

Examiner: Dave Woolf

Claims searched: 1-63

Date of search: 11 October 2004

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	31	US 4428474 A (GAU) Whole document, especially figures 1 and 2
X	31	US 4512456 A (PEYTON) Whole document, especially figures 1 and 3.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^W :

A4F

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

A47L

The following online and other databases have been used in the preparation of this search report

Epodoc, WPI, PAJ